

**U.S. Department of Energy**  
**Performance Evaluation Study**  
**MAPEP-03-W11**

**CLOSING DATE    April 28, 2004, 1800 MST**

\*\*\*\*\*

**Radioactive Decay Correction Date for this Sample:**  
**November 1, 2003, 12:00 Mountain Standard Time (MST).**

**PLEASE READ ALL INSTRUCTIONS**  
**CAREFULLY BEFORE ANALYZING SAMPLE**

**IMMEDIATELY UPON RECEIPT OF SAMPLES**  
**CHECK FOR BREAKAGE AND SHIPPING ERRORS;**  
**SAMPLE REPLACEMENT TAKES AT LEAST**  
**2 TO 3 DAYS**

## INSTRUCTIONS FOR MAPEP-03-W11 WATER SAMPLE

1. Domestic laboratories performing radiological/inorganic AND organic analyses will receive TWO one-liter sample bottles; the organic shipment should follow the radiological/inorganic shipment by about one week. **It is CRITICAL that radiological and stable inorganic analyses utilize sample from ONLY the bottle marked for radiological and inorganic analyses. Organic analyses must utilize sample from ONLY the bottle marked for organic analyses.** Failure to utilize the appropriate sample bottle will yield incorrect results.

Supplemental instructions are enclosed for international shipments.

Analyze the sample for those analytes that comprise your routine function or constitute your compliance requirements.

### REPORTING INORGANIC ANALYTES:

Some of the inorganic analytes listed on the MAPEP-03-W11 sample description may not be above the lower concentration range stated. Report only stable inorganic analytes detected above the stated lower concentration range. Total uranium, uranium-238, and uranium-235 can be reported when utilizing mass spectrometric techniques under the stable inorganic analytes section. Report all results based on a sample weight in mg/L (milligrams per Liter). “Less Than” (<) with an established Detection Limit is acceptable for reporting Stable Inorganic Analytes. Results reported as zeros will be flagged as unacceptable. **DO NOT USE 0.00 (zero) as a reportable value.**

### REPORTING RADIOLOGICAL ANALYTES:

Radiological analyses should report results for only the analytes listed on the sample description. Other analytes may be detectable but will not be evaluated. Conversely, some of the radiological analytes listed on the sample description may not be detected. Report the actual results obtained for sensitivity determination and false positive testing, including negative numbers (i.e., do not report results as “Less Than” or “Not Detected”). Report all results in Bq/L (Becquerel per Liter).

### REPORTING SEMIVOLATILE ORGANIC ANALYTES:

Organic analyses should report only the detectable analytes from the targeted organic classes. Report all results in µg/L (micrograms per Liter).

**DO NOT USE CLP reporting flags (U, J, etc. ). DO NOT USE 0.00 (zero) as a reportable value.**

## 2. SAMPLE DESCRIPTION

The analytes for the MAPEP-03-W11 water, and their concentration ranges, are listed in the following tables. Each radiological/stable inorganic sample contains approximately 1 Liter of 5% (v/v) nitric acid in water.

### RADIOLOGICAL CONSTITUENT DESCRIPTION

| Analyte  | Concentration Range | Analyte  | Concentration Range |
|--|---------------------|--|---------------------|
| $^{241}\text{Am}$ , $^{238}\text{Pu}$ , $^{239}\text{Pu}$ ,<br>$^{234}\text{U}$ , $^{238}\text{U}$ | < 15 Bq/L           | $^{57}\text{Co}$ , $^{134}\text{Cs}$ , $^{137}\text{Cs}$ , $^{55}\text{Fe}$ ,<br>$^{63}\text{Ni}$ , $^{54}\text{Mn}$ , $^{65}\text{Zn}$ , $^{60}\text{Co}$ | < 2000 Bq/L         |
| $^{90}\text{Sr}$ , $^{99}\text{Tc}$  | < 100 Bq/L          | $^3\text{H}$   | <1000 Bq/L          |

NOTE: The  $^{234}\text{U}$  and  $^{238}\text{U}$  isotopes may NOT be in equilibrium. Some of the radionuclides listed on the sample description may not be detected.  $^{99}\text{Tc}$  and  $^3\text{H}$  have been added to the analyte list.

### STABLE INORGANIC CONSTITUENT DESCRIPTION

| Analyte                              | Concentration Range | Analyte | Concentration Range |
|--------------------------------------|---------------------|---------|---------------------|
| Ag, Be, Cr(Total), Cu,<br>Ni, Pb, Zn | 0.01 – 5.0 mg/L     | Tl, V   | 0.01 – 10 mg/L      |
| As, Cd, Sb, Se                       | 0.01 – 0.9 mg/L     | Ba      | 0.1 - 50 mg/L       |

NOTE: Not all the stable inorganic constituents listed in the table above are present. Laboratories should only report those constituents that are quantitated ABOVE the minimum concentration range listed for that analyte.

### SEMI-VOLATILE ORGANIC SAMPLE DESCRIPTION

Sample holding time is based upon the date of **RECEIPT** of the sample by the participating laboratory. ug = micrograms L = Liter

| Analyte Class            | Concentration Range | Analyte Class          | Concentration Range |
|--------------------------|---------------------|------------------------|---------------------|
| Phthalate Esters         | < 100 ug/L          | Polynuclear Aromatics  | < 100 ug/L          |
| Phenols                  | < 125 ug/L          | Nitroaromatics         | < 100 ug/L          |
| Chlorinated Hydrocarbons | < 80 ug/L           | Chlorinated Pesticides | < 10 ug/L           |

3. You are required to report only ONE result for each appropriate analyte. If the reported result is actually a mean of several replicate analyses, the reported uncertainty should also be the MEAN of the INDIVIDUAL uncertainties. Do NOT propagate the individual uncertainties for replicate measurements. For example,

assume three replicate analyses provided the following results and individual uncertainties: 101 +/- 12, 108 +/- 15, 110 +/- 16. The mean result is  $(101+108+110)/3=106$  and the MEAN INDIVIDUAL UNCERTAINTY is  $(12+15+16)/3=14$ . The reported result and uncertainty is 106 +/- 14. The total uncertainty should be at the one sigma level. If propagated uncertainties are not currently available for stable inorganic or organic analyses, you should report laboratory control sample (LCS) or surrogate spike data (see the MAPEP Handbook). Propagated uncertainties are strongly encouraged.

4. The laboratory may choose the analytical method.
5. The amount of sample is limited. The laboratory should use the list of concentration ranges to select the optimum amount of sample for each analysis to ensure that sufficient sample is available for all of the analyses.
6. Excess sample or residues shall not be returned to RESL. Do not initiate analysis of the sample if approved waste treatment, storage, or disposal options are not available.
7. Report results electronically via the World Wide Web application at <http://mapep.inel.gov/>. Login information including user ID and password are in the cover letter associated with this sample.
8. Please ensure that your lab code, addresses, and NRC license information is entered correctly in the data entry program. You are a U.S. Federal Laboratory ONLY if your employees are federal government workers (i.e., EPA, USGS, EML, NRC, etc.) If you are a primary contractor for a DOE National Laboratory you may have a DOE exemption and, if so, need to enter your contract number. Participants that are subcontracted to do analyses for other MAPEP participants need to list their contracting laboratories under the ADDITIONAL ADDRESSES option (under LABORATORY INFORMATION in the main menu; see the MAPEP HANDBOOK).
9. The reference date for radioactive decay correction is **November 1, 2003, 12:00 Mountain Standard Time (MST)**. Sample holding time is based upon the date of RECEIPT of the sample by the participating laboratory.
10. **Results are due by April 28, 2004, 1800 MST**. Late results will not be included in the final report.
11. Please address any questions to the appropriate point of contact:

Jim Dahlgran (208-526-6243, dahlgrjr@inel.gov): data entry and organic analyses  
Leon Jensen (208-526-4591, jensenll@inel.gov): stable inorganic analyses  
David Sill (208-526-8031, sillds@inel.gov): radiological analyses

## MAPEP Sample Semi-Volatile Organic Target Compounds

Soil and water samples may contain any of the following compounds.

### MAPEP Target Analyte List

#### ***Phenols***

4-Chloro-3-methylphenol  
2-Chlorophenol  
2,4-Dichlorophenol  
2,6-Dichlorophenol  
2,4-Dimethylphenol  
2,4-Dinitrophenol  
4,6-Dinitro-2-methylphenol  
2-Methylphenol  
4-Methylphenol  
3-Methylphenol  
2-Nitrophenol  
4-Nitrophenol  
Pentachlorophenol  
Phenol  
2,3,4,6-Tetrachlorophenol  
2,4,5-Trichlorophenol  
2,4,6-Trichlorophenol  
Dinoseb

#### ***Chlorinated Hydrocarbons***

2-Chloronaphthalene  
1,3-Dichlorobenzene  
1,4-Dichlorobenzene  
1,2-Dichlorobenzene  
Hexachlorobenzene  
Hexachlorobutadiene  
Hexachlorocyclopentadiene  
Hexachloroethane  
1,2,4,5-Tetrachlorobenzene  
1,2,4-Trichlorobenzene  
Pentachlorobenzene  
Pentachloronitrobenzene  
4-Chloroaniline

#### ***Other***

o-Toluidene  
Benzyl alcohol  
Dibenzofuran  
2-Naphthylamine  
Aniline  
1,4-phenylenediamine

#### ***Chlorinated Pesticides***

alpha-BHC  
delta-BHC  
Heptachlor epoxide  
Dieldrin  
Endosulfan Sulfate  
beta-BHC  
Heptachlor  
Endosulfan I  
Endrin  
Endrin Ketone

#### ***Nitroaromatics***

#### ***Cyclic Ketones***

Nitrobenzene  
1,3-Dinitrobenzene  
1,2-Dinitrobenzene  
1,4-Dinitrobenzene  
2,4-Dinitrotoluene  
2,6-Dinitrotoluene  
2-Nitroaniline  
3-Nitroaniline  
4-Nitroaniline  
Isophorone  
1,4-naphthoquinone

#### ***Phthalate Esters***

Dimethylphthalate  
Diethylphthalate  
Di-n-butylphthalate  
Butylbenzylphthalate  
Bis(2-ethylhexyl)phthalate  
Di-n-octylphthalate

#### ***PAHs***

2-methylnaphthalene  
Naphthalene  
Acenaphthylene  
Acenaphthene  
Fluorene  
Phenanthrene  
Anthracene  
Fluoranthene  
Pyrene  
Benzo(a)anthracene  
Chrysene  
Benzo(b)fluoranthene  
Benzo(k)fluoranthene  
Benzo(a)pyrene  
Indeno(1,2,3-c,d)pyrene  
Dibenzo(a,h)anthracene  
Benzo(g,h,i)perylene

**MATERIAL SAFETY DATA SHEET IS ENCLOSED**

**END OF INSTRUCTIONS**